Fourth Five-Year Review Report
for
Pickettville Road Landfill
FLD980556351

Jacksonville
Duval County, Florida

January 2016

United States Environmental Protection Agency
Region 4
Atlanta, Georgia

Approved by:

Franklin E. Hill, Director
Superfund Division

Date: 2/24/16

Fourth Five-Year Review Report
for
Pickettville Road Landfill
5150 Pickettville Road
Jacksonville
Duval County, Florida

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List of Acronyms

ACL	Alternate Concentration Limit
ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
COC	Contaminant of Concern
d-BHC	Delta-Benzene Hexachloride
DMW	Deep Monitoring Well
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Differences
FDEP	Florida Department of Environmental Protection
FDER	Florida Department of Environmental Regulation
FS	Feasibility Study
FYR	Five-Year Review
GCL	Geosynthetic Clay Liner
GP	Gas Probe
HCW	Hawthorne Contact Well
HQ	Noncancer Hazard Quotient
IC	Institutional Control
LEL	Lower Explosive Limit
LTPC	Logistical Transportation and Petroleum Company
MCL	Maximum Contaminant Level
µg/L	Microgram per liter
MNA	Monitored Natural Attenuation
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
OU	Operable Unit
PCOR	Preliminary Close-Out Report
PRLS	Pickettville Road Landfill Site
PRP	Potentially Responsible Party
RA	Remedial Action
RD	Remedial Design
RAO	Remedial Action Objective
RFWMP	Revised Final Groundwater Monitoring Plan
RI	Remedial Investigation
ROD	Record of Decision
RPM	Remedial Project Manager
SMW	Shallow Monitoring Well
TBC	To-Be-Considered
µg/L	Micrograms per liter
UST	Underground Storage Tank
VISL	Vapor Intrusion Screening Level
VOC	Volatile Organic Compound

Executive Summary

The 52-acre Pickettville Road Landfill Superfund Site (the Site) is located 5 miles northwest of downtown Jacksonville, in Duval County, Florida. From the 1940s to 1960s, operators primarily used the site property as a borrow pit for fill material. Operators subsequently filled borrow areas with municipal and industrial wastes. In 1968, the City of Jacksonville (City) began leasing the Site for full-scale landfill operations. In 1971, the City used the landfill for disposal of hazardous wastes. Routine inspections by the Duval County Department of Health and Welfare between May 1975 and November 1976, identified inadequate waste disposal and maintenance practices. Landfill operations ceased in July 1977. The City closed the landfill, using a soil cover that was graded and seeded with vegetation. Former site operations contaminated groundwater with metals, volatile organic compounds (VOCs) and pesticides. The United States Environmental Protection Agency (EPA) listed the Site on the National Priorities List (NPL) on September 8, 1983. The triggering action for this five-year review (FYR) was the signing of the third FYR on February 23, 2011.

The Site's remedy currently protects human health and the environment because waste material has been excavated from Little Sixmile Creek and residual contamination is contained beneath a landfill cover system. Restrictions are in place to prevent groundwater use and future land uses that could damage the remedial components. For the remedy to remain protective over the long term, issues concerning operation and maintenance (O&M) and remedy performance should be addressed.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: Pickettville Road Landfill		
EPA ID: FLD980556351		
Region: 4	**State:** FL	**City/County:** Jacksonville/Duval County
SITE STATUS		
NPL Status: Final		
Multiple OUs? No	**Has the site achieved construction completion?** Yes	
REVIEW STATUS		
Lead agency: EPA		
Author name: Eric Marsh and Claire Marcussen (Reviewed by the EPA)		
Author affiliation: Skeo Solutions		
Review period: March 2015 – February 2016		
Date of site inspection: April 28, 2015		
Type of review: Statutory		
Review number: 4		
Triggering action date: February 23, 2011		
Due date *(five years after triggering action date)*: February 23, 2016		

Five-Year Review Summary Form (continued)

Issues/Recommendations

OU(s) without Issues/Recommendations Identified in the Five-Year Review:
OU1: No issues identified.

Five-Year Review Summary Form (continued)

Sitewide Protectiveness Statement
Protectiveness Determination: Short-term Protective
Protectiveness Statement: The Site's remedy currently protects human health and the environment because waste material has been excavated from Little Sixmile Creek and residual contamination is contained beneath a landfill cover system. Restrictions are in place to prevent groundwater use and future land uses that could damage the remedial components. For the remedy to remain protective over the long term, issues concerning operation and maintenance (O&M) and remedy performance should be addressed.

Environmental Indicators
- Current human exposures at the Site are under control. *- Current groundwater migration is under control.*

Are Necessary Institutional Controls in Place?
☒ All ☐ Some ☐ None

Has EPA Designated the Site as Sitewide Ready for Anticipated Use?
☒ Yes ☐ No

Has the Site Been Put into Reuse?
☐ Yes ☒ No

Fourth Five-Year Review Report
for
Pickettville Road Landfill Superfund Site

1.0 Introduction

The purpose of a five-year review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy will continue to be protective of human health and the environment. FYR reports document FYR methods, findings and conclusions. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The United States Environmental Protection Agency (EPA) prepares FYRs pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Section 121 and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA Section 121 states:

> If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each 5 years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

EPA interpreted this requirement further in the NCP, 40 Code of Federal Regulations (CFR) Section 300.430(f)(4)(ii), which states:

> If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after initiation of the selected remedial action.

Skeo Solutions, an EPA Region 4 contractor, conducted the FYR and prepared this report regarding the remedy implemented at the Pickettville Road Landfill Superfund site (the Site) in Jacksonville, Duval County, Florida. The EPA's contractor conducted this FYR from March 2015 to February 2016. The EPA is the lead agency for developing and implementing the remedy for the potentially responsible party (PRP)-financed cleanup at the Site. Florida Department of Environmental Protection (FDEP), as the support agency representing the State of Florida, has reviewed all supporting documentation and provided input to the EPA during the FYR process.

This is the fourth FYR for the Site. The triggering action for this statutory review is the previous FYR, signed in February 2011. The FYR is required because hazardous substances, pollutants or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure. The Site consists of one operable unit (OU).

2.0 Site Chronology

Table 1 lists the dates of important events for the Site.

Table 1: Chronology of Site Events

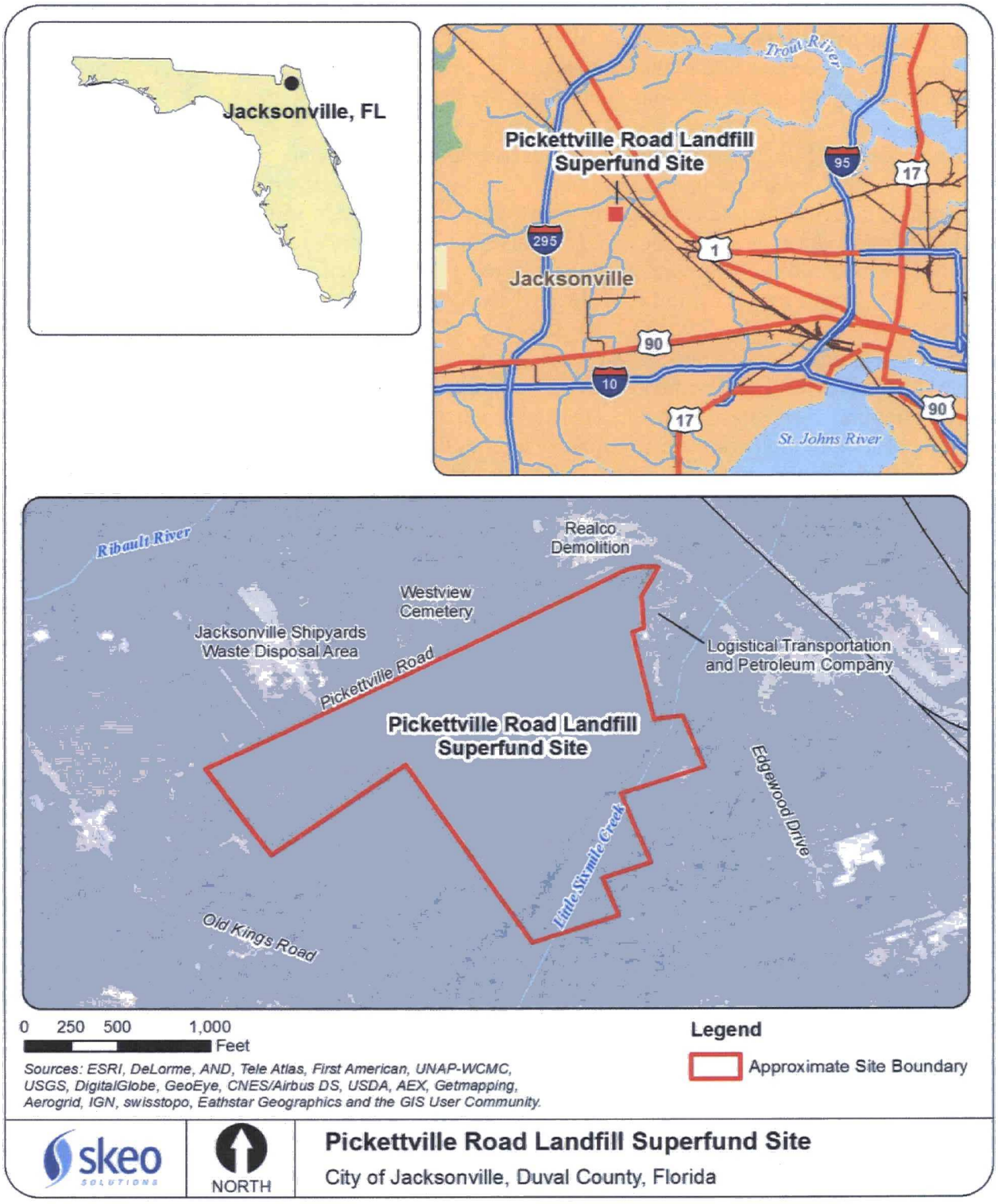
Event	Date
The Duval County Department of Health and Welfare conducted site inspections	1975 and 1976
The EPA completed a preliminary assessment at the Site	March 1, 1980
The EPA completed a site investigation at the Site	May 1, 1980
The EPA discovered contamination at the Site	June 1, 1981
The EPA proposed the Site for listing on the Superfund program's National Priorities List (NPL)	December 30, 1982
The EPA finalized the Site on the NPL	September 8, 1983
PRPs began the remedial investigation/feasibility study (RI/FS)	September 30, 1984
The EPA and PRPs entered into an Administrative Order on Consent to complete the RI/FS	February 10, 1986
PRPs completed the RI/FS	March 5, 1990
The EPA revised the FS report and performed a site-specific risk assessment	June 8, 1990
The EPA signed the Record of Decision (ROD)	September 28, 1990
The EPA issued a Unilateral Administrative Order to the PRPs to complete the remedial design/remedial action (RD/RA)	June 28, 1991
The PRPs initiated RD phase I	February 6, 1992
PRPs completed RD and initiated the RA for phase I; PRPs initiated RD for phase II	April 23, 1992
The EPA and PRPs entered into Consent Decree to complete the site remedial action	April 24, 1992
PRPs completed RA for phase I	July 1, 1993
PRPs completed RD for phase II and initiated RA for phase II	September 3, 1993
The EPA signed the Explanation of Significant Differences (ESD) to change the landfill cover system from a clay barrier layer to a geosynthetic clay liner (GCL)	March 1996
PRPs completed RA for phase II	July 14, 1997
The EPA and PRPs enter into a Consent Decree requiring PRP to reimburse RA costs to the EPA	September 24, 1998
The EPA completed the first FYR	September 29, 1999
PRPs completed a focused FS	April 9, 2003
The EPA completed the second FYR	January 31, 2006
PRPs completed supplemental groundwater and surface water investigations	September 1, 2008
The EPA issued a Preliminary Close-Out Report (PCOR)	September 24, 2008
The EPA completed the third FYR	February 23, 2011

3.0 Background

3.1 Physical Characteristics

The 52-acre Site is located at 5150 Pickettville Road, 5 miles northwest of downtown Jacksonville, in Duval County, Florida (Figure 1). The Site is in an area with mixed industrial and residential use and includes some forested areas. The Site is bordered to the north and northwest by Pickettville Road, to the east and southeast by Little Sixmile Creek, and to the west and southwest by rural/residential areas.

Figure 1: Site Location Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding the EPA's response actions at the Site.

Adjacent industry is mostly north and northwest of Pickettville Road and includes the Jacksonville Shipyards Waste Disposal Area, the Westview Cemetery and the Realco Demolition Landfill Facility. The Logistical Transportation and Petroleum Company (LTPC) is northeast of the Site. Rural and residential properties border the Site to the southwest. The Site is unoccupied, vegetated and fenced. There are monitoring wells and passive gas vents along the site perimeter.

Stormwater runoff at the Site generally flows to the east-southeast and discharges into Little Sixmile Creek. Stormwater control features include Ditches 1, 2 and 3, which divert surface runoff to Pond 1 and Pond 2. The ponds divert water to a concrete spillway, which discharges to Little Sixmile Creek (Figure 2). During heavy rain events, an emergency spillway diverts water from Pond 1 to Little Sixmile Creek and a 24-inch riser pipe controls discharge from Pond 2 to Little Sixmile Creek. Little Sixmile Creek flows north and discharges into Sixmile Creek, located 1,000 feet north of the Site.

Four hydrogeological units occur beneath the Site. In descending order, these are the upper sand aquifer, rock aquifer, Hawthorne confining unit and Floridan Aquifer. The topography of the Site, prior to operation as a sand borrow area and landfill, consisted of a northeastward trending ridge. Site operators modified the natural topography of the Site by excavation of the ridge and subsequent filling of the depression during landfill operations, resulting in the western portion of the Site sloping toward Sixmile Creek. Based on the changed Site topography, groundwater flow in the upper sand aquifer on the northwestern portion of the property is in a northeastern direction and then flows east-southeast to Little Sixmile Creek. Vertical groundwater flow gradients between the upper sand and rock aquifers are generally downward in wells located away from Little Sixmile Creek, and generally upward in wells near the creek. Groundwater from the upper sand aquifer and rock aquifer discharges into Little Sixmile Creek.

The rock aquifer is the major water-producing zone at the Site. The Hawthorne confining unit is the regional upper confining unit for the Floridan Aquifer. The Floridan Aquifer is the principal source of fresh water in northeastern Florida; it is under artesian conditions.

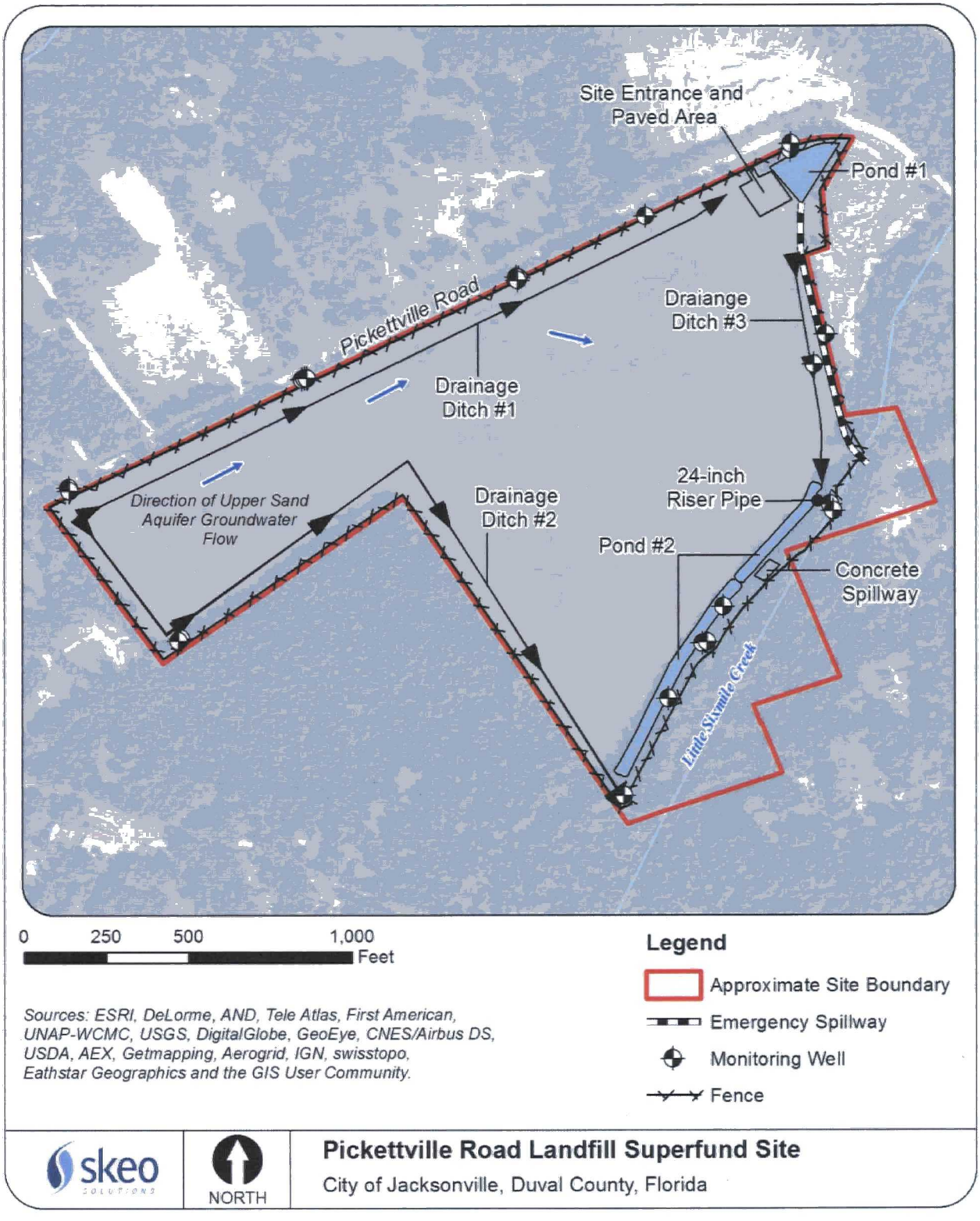
3.2 Land and Resource Use

Before 1968, operators used the Site as a borrow pit, primarily for sand fill material. This activity left large below-grade excavations. In 1968, the City of Jacksonville (City) leased the site property and began using it as a landfill. The City ceased operating the landfill in July 1977. The City currently owns the Site, which includes two parcels. The Site is zoned for light industrial use and industrial business park use. The surrounding area is zoned for mixed industrial and residential use. There are currently no plans for reuse at the Site, and land use in the area is not anticipated to change. Restrictions are in place to prevent the use of groundwater in the upper sand aquifer, which could be a drinking water source because it is Class IIB under EPA groundwater classification guidelines. According to FDEP's Map Direct, the nearest private water wells are nearly 1 mile southwest and a half mile south of the Site. The nearest non-community potable systems are 1 mile south and southeast of the Site. The wells identified in FDEP's Map Direct are hydraulically upgradient or side gradient of the Site.

3.3 History of Contamination

Until 1971, the City disposed of municipal and industrial wastes at the Site, including oil, lead acid battery liquid waste, battery casings, light terpene sludge and polychlorinated biphenyls. After 1971, the Site accepted only hazardous wastes. In September 1972, the Jacksonville Public Health and Welfare

Figure 2: Detailed Site Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding the EPA's response actions at the Site.

Committee (Committee) permitted the Site as a municipal dump. In February 1974, the Florida Department of Environmental Regulation (FDER) (now FDEP) recommended issuance of a temporary operating permit, pending hydrological and soil studies. The Duval County Department of Health and Welfare conducted site inspections in 1975 and 1976. These inspections revealed improper waste disposal and maintenance practices, including disposal of wastes without a soil cover, a lack of readily available cover soil, poor surface drainage, inconsistent cover depth and inadequate control of leachate along Little Sixmile Creek. The inspections revealed that excavation was occurring beneath the water table, a drainage canal had been dug to Little Sixmile Creek, and water pumped from the interior of the Site was being spread throughout the landfill area. Improper landfilling operations resulted in contamination of soil and groundwater with metals and volatile organic compounds (VOCs).

3.4 Initial Response

In March 1977, the City closed the landfill to nonhazardous wastes, but continued to accept hazardous waste until a suitable alternative could be found. In July 1977, the City ceased all operations at the landfill and closed it with a graded soil cover and vegetation.

In November 1979, FDER found elevated levels of iron and chromium in on-site wells. In 1980 the EPA completed a preliminary assessment and site investigation and by June 1981, the EPA confirmed the presence of contamination in groundwater, surface water, soil and leachate. In March 1982, the EPA notified the property owners, H.H. Claussen and the City of Jacksonville, of their roles as PRPs at the Site. In June and July 1982, the EPA and FDER identified on-site erosion and leachate problems. In November 1982, the PRPs installed a retaining wall to correct the problems. A subsequent EPA inspection noted the persistence of the leachate problem at the Site. On December 30, 1982, the EPA proposed the Site for inclusion on the National Priorities List (NPL). The Site was finalized on the NPL on September 8, 1983.

Between 1984 and 1985, the EPA began searching for additional site PRPs to conduct the remedial investigation (RI) and feasibility study (FS). Many of the identified PRPs formed the Pickettville Road Landfill Site (PRLS) Group to address site issues. The PRPs signed an Administrative Order on Consent in 1986, agreeing to conduct the RI and FS work at the Site. The PRPs completed an RI in 1987 and prepared a supplemental sampling report in 1988 to address deficiencies in the RI. The PRPs completed the FS report in 1990.

3.5 Basis for Taking Action

Based on the results of the RI/FS, the PRPs concluded that waste disposal activities at the Site contaminated groundwater and that hypothetical consumption of upper sand aquifer groundwater would pose unacceptable risks due to the presence of (VOCs and metals. The PRPs also concluded that exposure to soil did not pose unacceptable risks to human health and the environment. The EPA and FDER considered the RI/FS and risk assessment inadequate. The EPA revised the FS Report and performed a site-specific risk assessment in June 1990. The EPA FS concluded that it was necessary to limit access and uncontrolled dumping, to address statutory requirements associated with management of an inactive municipal landfill, and to assist in leachate and groundwater management to prevent exposure.

4.0 Remedial Actions

In accordance with CERCLA and the NCP, the overriding goals for any remedial action are protection of human health and the environment and compliance with applicable or relevant and appropriate requirements (ARARs). A number of remedial alternatives were considered for the Site, and final selection was made based on an evaluation of each alternative against nine evaluation criteria that are specified in Section 300.430(e)(9)(iii) of the NCP. The nine criteria are:

1. Overall Protection of Human Health and the Environment
2. Compliance with ARARs
3. Long-Term Effectiveness and Permanence
4. Reduction of Toxicity, Mobility or Volume through Treatment
5. Short-Term Effectiveness
6. Implementability
7. Cost
8. State Acceptance
9. Community Acceptance

4.1 Remedy Selection

The Site's Record of Decision (ROD) was signed on September 28, 1990, to address source contamination and contaminated groundwater. The ROD did not establish formal remedial action objectives (RAOs), but called for a remedy that would:

- Provide immediate protection to human health from potential threats associated with direct contact with the contaminated surface soil, waste and groundwater.
- Provide an equal amount of protection as a performance base landfill cover because the waste is deposited in the water table.

The major components of the selected remedy include:

- Removal of waste along Little Sixmile Creek and an ecological study of the creek to determine if additional remediation is warranted.
- Construction of a clay landfill cover with a passive gas collection system.
- Installation of a perimeter security fence.
- Implementation of a long-term groundwater monitoring program to periodically evaluate the hydrogeologic conditions and quality of groundwater under the Site in accordance with alternate concentration limits (ACLs) demonstration.
- Extension of the city water main to residents located immediately north of the Site to supply alternative sources of potable water.
- Implementation of institutional controls, including deed restrictions to limit groundwater usage and regulate future development of the Site.
- Implementation of a well abandonment program for upper sand aquifer wells immediately north of the Site.

The ROD established ACLs as the cleanup goals for groundwater contaminants of concern (COC) in compliance wells at the landfill edge. The ROD only established groundwater cleanup goals for benzene

and vinyl chloride because these were the only COCs detected above maximum contaminant levels (MCLs) in off-site groundwater. The ACLs are calculated to be protective of ecological receptors in the Little Sixmile Creek (Table 2). The ACLs are contingent on institutional controls being established to limit groundwater use that could result in human exposure to contaminants.

Table 2: Cleanup Goals for Groundwater COCs

COC	ROD Cleanup Goal[a] (µg/L)
Benzene	115
Vinyl chloride	115
µg/L = micrograms per liter Notes: a. ACL is established for COCs in on-site groundwater at the edge of the landfill, based on a groundwater to surface water dilution factor.	

The ROD further calls for the remaining COCs to be compared to MCLs, when available (Table 3), because the upper sand aquifer is classified as a potential drinking water source. If a COC is detected above an MCL, further analysis of remedial alternatives will be conducted. The ROD will then be amended if necessary to address the groundwater contamination.

Table 3: Trigger Levels for a Feasibility Analysis of Groundwater Remedy Alternatives

COC[a]	1990 ROD Trigger Levels (µg/L)[b]
Metals	
Arsenic	50
Barium	1,000
Cyanide	NA
Lead	50
Mercury	2
Nickel	NA
Volatile Organic Compounds (VOCs)	
Acetone	NA
Benzene	1
Toluene	NA
Vinyl chloride	NA
Pesticides	
Delta-benzene hexachloride (d-BHC)	NA
Notes: a. From 1990 ROD Table 6-1 b. Florida Primary drinking water standard listed in Appendix B of the 1990 ROD NA = MCL not available at the time of the 1990 ROD	

In 1996, the EPA issued an ESD to modify the selected remedy at the Site. The 1996 ESD specified a geosynthetic clay liner (GCL) in place of the clay barrier layer in the landfill cover system. Cleanup goals established in the 1990 ROD remain unchanged.

4.2 Remedy Implementation

The PRPs started the first phase of remedial design in February 1992 and started phase I of the remedial action in April 1992. Between March and July 1992, the PRPs extended the city water main to 10

properties north of the Site and between the Site and Little Sixmile Creek. The PRPs constructed a 6-foot high barbed wire fence around the Site from July to August 1992. In August 1992, the PRPs completed a well survey for wells in the area around the Site that qualified for the plug and abandonment program. In April 1993, the PRPs received verbal permission from property owners to install water line hook-ups and perform well abandonment activities at the identified properties. Based on the survey, the PRPs plugged and abandoned seven wells in June and July 1993. One owner declined to have his well plugged; however, the well is located outside the area designated for institutional controls. On July 22, 1993, the PRPs filed a notice and deed restrictions with Duval County Public Records for the landfill property to restrict the use of groundwater and also landuse (see Section 6.3 for more detail).

The PRPs began remedial design for the phase II of remedial action in April 1992 and started remedial action in September 1993. The PRPs cleared the Site in October 1993. Between May 1994 and December 1996, the PRPs constructed the gas control system. The PRPs constructed the stormwater control system from June 1994 to December 1995. The stormwater control system includes perimeter ditches, two retention ponds, and emergency spillways at each pond. The perimeter ditches collect run-off from the landfill cover area and discharge into the two on-site ponds. The emergency spillways were designed to handle excess run-off and discharge to Little Sixmile Creek.

From September 1994 to February 1996, the PRPs began landfill cover construction by placing fill material in the landfill to bring it to grade followed by the settlement period. In March 1996, the EPA issued an ESD to allow a GCL instead of the clay layer. The GCL and vegetative layer were added between September and December 1996.

The PRPs completed restoration activities at Little Sixmile Creek between August 1994 and March 1995. This included removal of waste and debris along the creek bank, re-grading the creek bank slope, integration of the modified section of the creek bank with upstream and downstream bank contours, and providing erosion control for the creek bank.

In 2003, the PRPs prepared a focused FS that recommended monitored natural attenuation (MNA) of arsenic and 1,1-dichloroethene above MCLs in site groundwater. In 2008, the PRPs completed a groundwater evaluation that demonstrated MNA would achieve RAOs specified in the 2003 focused FS. The PRPs also conducted groundwater/surface water interface sampling to evaluate consistently elevated arsenic detections in shallow monitoring wells 18 and 21 (SMW-18 and SMW-21). The EPA reviewed arsenic data and concluded in September 2008 that arsenic did not exceed its MCL in the groundwater/surface water interface in the creek. Based on these findings, the EPA signed the Preliminary Close-Out Report (PCOR) in September 2008 to document that all construction activities were complete.

4.3 Operation and Maintenance (O&M)

According to the 1990 ROD, the O&M period for the Site is 20 years. Routine O&M activities at the Site include site inspections, closure cover maintenance, stormwater management system maintenance, gas control system maintenance, groundwater monitoring, gas monitoring and surface water discharge monitoring. The PRPs complete site inspections semi-annually, and O&M reports are submitted to the EPA annually.

The 1990 ROD estimated O&M costs of $171,000 per year over the 20-year O&M period. However, costs projected by the PRPs during remedial design illustrate an annual cost reduction over the O&M period (Appendix G). O&M costs incurred by the PRPs during the previous five years are summarized in Table 4. These costs are slightly lower than forecasted during remedial design for monitoring years 13 (2010) through 17 (2014), which were estimated at about $70,000 per year.

Table 4: Annual O&M Costs

Date Range	Total Cost *(rounded to the nearest $1,000)*
August 2009 through July 2010	$32,000
August 2010 through July 2011	$50,000
August 2011 through July 2012	$21,000[a]
August 2012 through July 2013	$51,000
August 2013 through July 2014	$60,000[b]

Notes:
a. Costs were lower because a sampling event was postponed due to adverse (soggy) site conditions and mowing could not be performed without damaging the cover.
b. Costs were higher because mowing costs increased significantly when the subcontractor was changed. The original subcontractor went out of business.

5.0 Progress Since the Last Five-Year Review

The protectiveness statement from the 2011 FYR for the Site stated the following:

The Site's remedy currently protects human health and the environment because it is functioning as intended by the Site's decision documents. Contaminated source material has been excavated or is being contained on site beneath a landfill cover system. Restrictions are in place to prevent future land uses that could damage the remedial components in place. No groundwater at the Site or in the area surrounding the Site is currently being used. Groundwater sampling shows that COC concentrations continue to decrease at the Site.

The 2011 FYR did not identify any follow-up actions. However, the 2011 FYR recommended that the PRPs evaluate whether the long-term MNA will achieve cleanup goals in a reasonable timeframe. MNA arsenic degradation rates indicate that MNA may take 60 years or longer to achieve ROD cleanup goals. The 60-year timeframe exceeds the ROD O&M timeframe of 20 years.

6.0 Five-Year Review Process

6.1 Administrative Components

EPA Region 4 initiated the FYR in March 2015 and scheduled its completion for February 2016. The EPA remedial project manager (RPM) Scott Martin led the site review team, which also included the EPA site attorney Karen Singer, EPA Community Involvement Coordinator L'Tonya Spencer, and contractor support provided to the EPA by Skeo Solutions. In March 2015, the EPA held a scoping call

with the review team to discuss the Site and items of interest as they related to the protectiveness of the remedy currently in place. The review schedule established consisted of the following activities:

- Community notification.
- Document review.
- Data collection and review.
- Site inspection.
- Local interviews.
- FYR Report development and review.

6.2 Community Involvement

The EPA published a public notice in the *Florida Times Union* newspaper announcing the commencement of the FYR process for the Site, providing contact information for Scott Martin and inviting community participation. The press notice is available in Appendix B. No one contacted the EPA as a result of the advertisement.

The EPA will make the final FYR Report available to the public. Upon completion of the FYR, the EPA will place copies of the document in the designated site repository: Highlands Branch Public Library, 1826 Dunn Avenue, Jacksonville, Florida 32218

6.3 Document Review

This FYR included a review of relevant site-related documents, including the ROD, remedial action reports and recent monitoring data. Appendix A provides a complete list of the documents reviewed.

ARARs Review

CERCLA Section 121(d)(1) requires that Superfund remedial actions attain "a degree of cleanup of hazardous substances, pollutants, and contaminants released into the environment and of control of further release at a minimum which assures protection of human health and the environment." The remedial action must achieve a level of cleanup that at least attains those requirements that are legally applicable or relevant and appropriate.

- Applicable requirements are those cleanup standards, standards of control and other substantive requirements, criteria or limitations promulgated under federal environmental or state environmental or facility siting laws that specifically address a hazardous substance, remedial action, location or other circumstance found at a CERCLA site.

- Relevant and appropriate requirements are those standards that, while not "applicable," address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site. Only those state standards more stringent than federal requirements may be applicable or relevant and appropriate.

- To-Be-Considered (TBC) criteria are non-promulgated advisories and guidance that are not legally binding, but should be considered in determining the necessary remedial action. For

example, TBC criteria may be particularly useful in determining health-based levels where no ARARs exist or in developing the appropriate method for conducting a remedial action.

Chemical-specific ARARs are health- or risk-based numerical values or methodologies which, when applied to site-specific conditions, result in the establishment of numerical values. These values establish an acceptable amount or concentration of a chemical that may remain in, or be discharged to, the ambient environment. Examples of chemical-specific ARARs include MCLs under the federal Safe Drinking Water Act and ambient water quality criteria enumerated under the federal Clean Water Act.

Action-specific ARARs are technology- or activity-based requirements or limits on actions taken with respect to a particular hazardous substance. These requirements are triggered by a particular remedial activity, such as discharge of contaminated ground water or in-situ remediation.
Location-specific ARARs are restrictions on hazardous substances or the conduct of the response activities solely based on their location in a special geographic area. Examples include restrictions on activities in wetlands, sensitive habitats and historic places.

Remedial actions are required to comply with the chemical-specific ARARs identified in the ROD. In performing the FYR for compliance with ARARs, only those ARARs that address the protectiveness of the remedy are reviewed.

Groundwater ARARs

According to the 1990 ROD, cleanup goals for groundwater COCs benzene and vinyl chloride were based on ACLs rather than ARARs. As described in Section 4.1 and Table 2 of this FYR, ACLs were calculated using the maximum allowable levels of the contaminants in surface water and the flow rate of groundwater from the Site to Little Sixmile Creek. The ACLs were set such that the migration of contaminants from the landfill at or below the ACLs will be protective of surface water quality at the point of discharge. Concentrations of vinyl chloride and benzene decreased well below their respective ACLs during the past five years. In this ARAR review, factors included in the ACL calculation at the Site were compared. There were no changes to these factors.

The 1990 ROD did not define cleanup goals for the remaining groundwater COCs, but stated that MCLs are considered ARARs for the Site. Groundwater is monitored for all COCs. Benzene and vinyl chloride concentrations are compared to ACLs and MCLs. Other COC concentrations are compared to federal and state MCLs because the upper sand aquifer is classified as a potential drinking water source. The 1990 MCLs for the remaining 10 COCs were compared with current federal and state MCLs (Table 5). Current MCLs for arsenic and lead are more stringent than the original MCLs at the time of the 1990 ROD. MCLs have become available since the 1990 ROD for cyanide, nickel (state MCL only) and toluene. Except for arsenic, long-term monitoring is using the more current ARARs.

Table 5: Summary of Groundwater Standards

COC	1990 ROD MCL Used to Trigger a Feasibility Analysis of Groundwater Remedy Alternatives (µg/L)[a]	2015 Drinking Water Standards[b] (µg/L)		Change in Standard
		Federal	State	
Metals				
Arsenic	50	10	10	More stringent
Barium	1,000	2,000	2,000	Less stringent
Cyanide	NA	200	200	New value
Lead	50	15	15[c]	More stringent
Mercury	2	2	2	None
Nickel	NA	NA	100	New value
VOCs				
Acetone	NA	NA	NA	None
Benzene	1	5	1	None
Toluene	NA	1,000	1,000	New value
Vinyl chloride	NA	2	1	None
Pesticides				
d-BHC	NA	NA	NA	None

Notes:
a. Florida primary drinking water standard listed in Appendix B of the 1990 ROD
b. The current groundwater standards (http://www.epa.gov/safewater/contaminants/index.html, accessed 5/19/2015) and Florida groundwater standards (http://www.dep.state.fl.us/water/drinkingwater/standard.htm, accessed 5/19/2015)
c. Florida adopted federal MCL
NA = MCL not available at the time of the 1990 ROD

Institutional Control Review

On April 21, 2015, Skeo staff conducted online review of the Duval County Public Research database, and found the deed information pertaining to the Site listed in Table 6.

Table 6: Deed Documents from Duval County Public Records Office

Date	Type of Document	Description	Book #	Page #
July 1993	Easement	Jax 51, Inc., the former owner of the site property, signed an easement to allow the EPA, contractors, consultants and employees access to the Site for remediation activities in accordance with terms and conditions set in the Consent Decree, Civil Action No. 92-133-Civ-J-16.	7624	1496
July 1993	Notice and Deed Restriction	Prohibits any use of the property that would obstruct, delay or disturb the remedial design, remedial action and/or O&M activities. Prohibits extraction and use of site groundwater. Prohibits residential, commercial, industrial or recreational uses except as may be required by the Consent Decree, Civil Action No. 92-133-Civ-J-16. Prohibits installation or construction of buildings, wells, roads, pipes or ditches.	7624	1499
http://oncore.duvalclerk.com/Search.aspx				

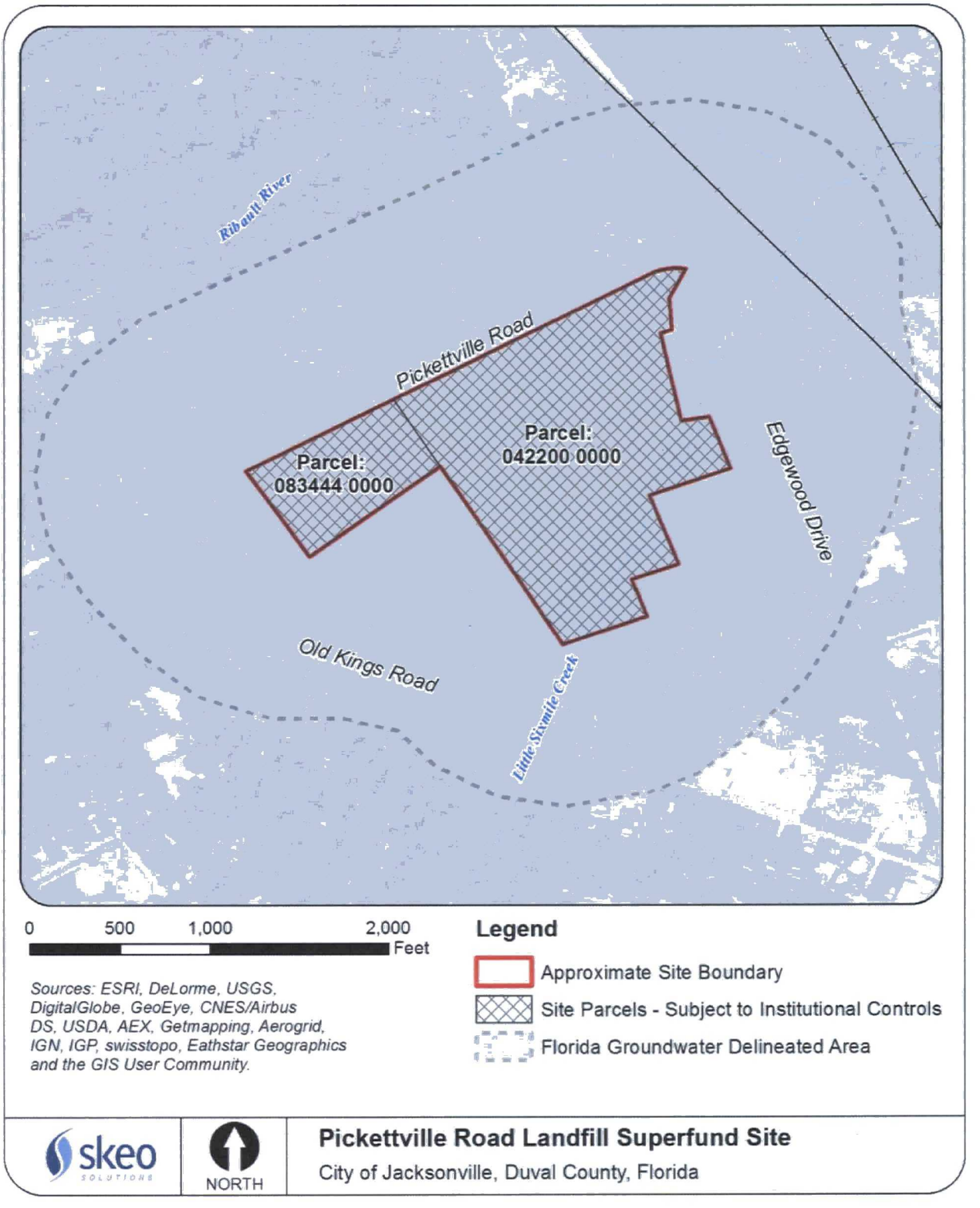
The July 1993 deed restriction serves as an institutional control to restrict groundwater and land use on the Site. It prohibits any use of the Site that would obstruct or disturb the remedy in place. It prohibits use of the site property for residential, commercial, industrial or recreational uses. It also limits construction of buildings or structures at the Site to those related to the selected remedy. The deed restriction also prohibits extraction or use of groundwater from the Site. In July 1993, an easement was signed by the former site property owner to allow the EPA, contractors, consultants and employees to access the Site for remediation activities in accordance with the terms and conditions set in the Consent Decree. The Site is located within a Florida Groundwater Delineated Area, which restricts placing wells on the Site and in areas around the Site within the delineated area (Figure 3).

The City of Jacksonville owns the Site, which includes two parcels, 042200-0000 and 083444-0000. Tables 7 lists the institutional controls associated with areas of interest at the Site. Figure 3 shows the property boundaries for the parcels at the Site with institutional controls.

Table 7: Summary of Institutional Controls (ICs)

Area of Interest – Pickettville Road Landfill Property (Parcels: 042200-0000 and 083444-0000)					
Media	**ICs Needed**	**ICs Called for in the Decision Documents**	**Impacted Parcel(s)**	**IC Objective**	**Instrument in Place**
Groundwater	Yes	Yes	042200-0000 083444-0000	Restrict installation of groundwater wells and extraction or use of groundwater from the Site.	The Site lies within a Florida Groundwater Delineated Area, which restricts well placement (see Figure 3).[a] Deed restriction prohibits extraction or use of groundwater from the Site.
Soil	Yes	Yes	042200-0000 083444-0000	Restrict any use of the property that would obstruct, delay or disturb the remedy in place at the Site.	Deed restriction prohibiting installation, construction or removal of buildings, wells, roads, pipes or ditches, or use of the Site other than for remediation purposes.
a. Florida's groundwater delineation information can be found online at: http://www.dep.state.fl.us/water/groundwater/delineate.htm.					

Figure 3: Florida Groundwater Delineated Area



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding the EPA's response actions at the Site, and is not intended for any other purpose.

6.4 Data Review

Groundwater

The 1993 Revised Final Groundwater Monitoring Plan (RFWMP) specified quarterly groundwater sampling for the first year and semi-annual sampling for up to 20 years (through 2017). The PRPs analyze groundwater samples for the COCs identified in the ROD. As requested by the EPA, additional parameters are analyzed to evaluate chemical transport. Based on the first three years of data, the PRPs stopped monitoring for pesticides and polychlorinated biphenyls in January 2001.

The PRPs currently sample two upgradient well clusters consisting of upper sand and the deeper rock aquifer monitoring wells (SMW/DMW-1 and SMW/DMW-16) and one upgradient shallow well (SMW-22). In addition, the PRPs sample 11 upper sand aquifer wells (SMW), four deeper rock aquifer wells (DMW) and two Hawthorn contact wells (HCWs) at the site perimeter (Figure 4). Groundwater data from July 2010 to October 2014 indicate that COC concentrations remain below groundwater ACLs and MCLs in the deep and Hawthorne wells. However, some exceedances of the MCLs were detected in shallow wells, as discussed below.

Arsenic was the only COC consistently above its MCL (10 µg/L) in more than one upper sand aquifer well during the previous five years. The PRPs report the consistent exceedance of the arsenic MCL downgradient of the landfill is likely due to the reducing conditions under the cap. Arsenic exceeded its MCL in shallow wells SMW-4, -9, -10, -18 and -21 (Table 8). The highest MCL exceedances were in SMW-18 (160 to 300 µg/L) and SMW-21 (< 10 µg/L to 130 µg/L), which is consistent with data collected since monitoring began in September 1997. Arsenic exceeded the MCL once in SMW-15 (23 µg/L in October 2014) and SMW-7R (16 µg/L in January 2013).

Table 8: Arsenic Concentrations in Upper Sand Aquifer Wells (µg/L)

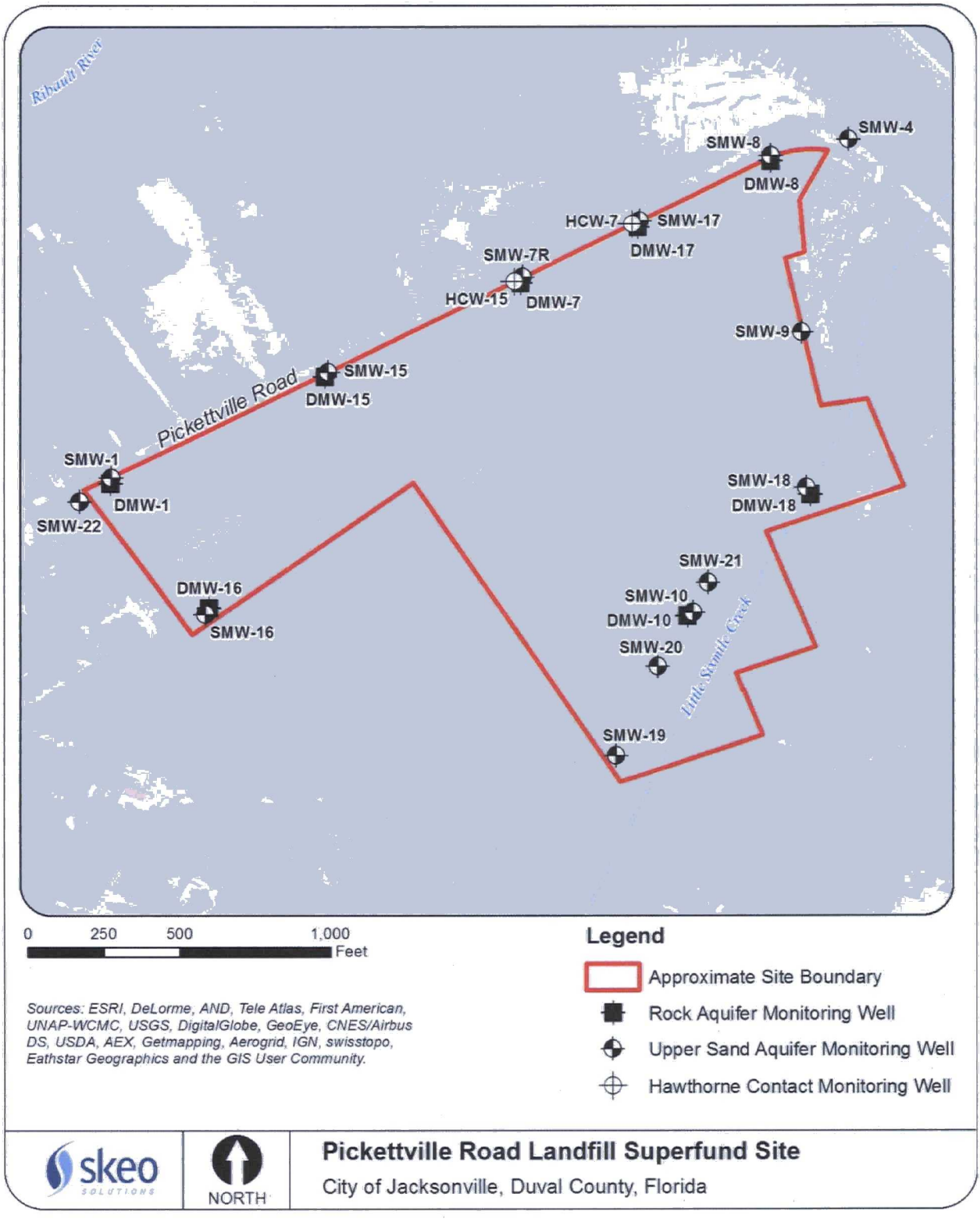
	Sample Date								
Well	**Jul-10**	**Jan-11**	**Jul-11**	**Jan-12**	**Aug-12**	**Jan-13**	**Jul-13**	**Apr-14**	**Oct-14**
SMW-4	***47***	***37***	***28***	***39***	***23***	***23***	***86***	***36***	***23***
SMW-9	***21***	***18***	***14***	***23***	***21***	***15***	***16***	***43***	***12***
SMW-10	***43***	***29***	***34***	***40***	***78***	***43***	***33***	***35***	***38***
SMW-18	***160***	***240***	***260***	***300***	***250***	***240***	***230***	***200***	***190***
SMW-21	***130***	***120***	***110***	***130***	***130***	***130***	***130***	***120***	<10

a. ***Bold italic*** – value exceeds the MCL of 10 µg/L

Lead was detected routinely above its MCL (15 µg/L) in only one well, SMW-10. The highest lead concentration occurred in August 2012 (240 µg/L), with concentrations generally ranging from < 5 µg/L to 35 µg/L. Concentrations of lead in the most recent April and October 2014 sampling events were 23 µg/L and 18 µg/L, respectively.

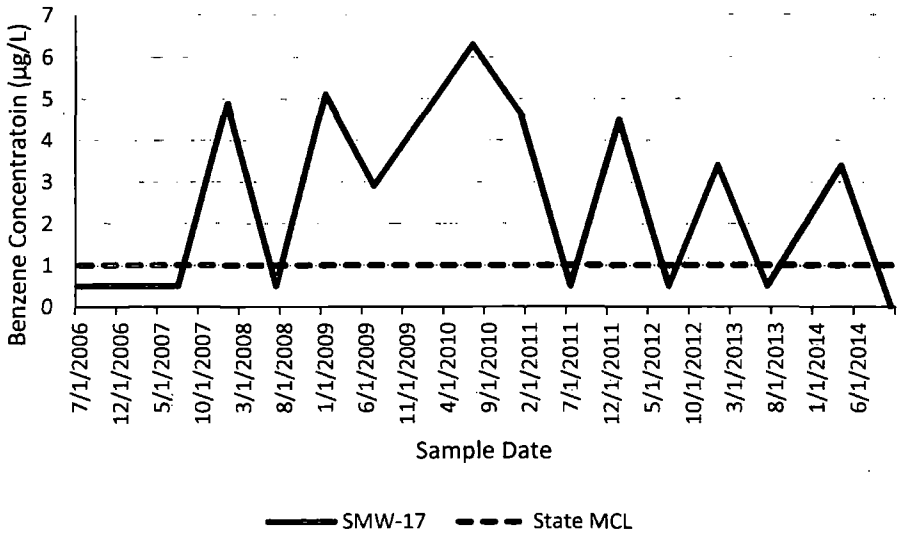
The PRPs detected several VOCs (1,1-dichloroethene; 1,1-dichloroethane; chlorobenzene; 1,2-dichloroethene; and benzene), but only benzene was above its MCL. Benzene was above its MCL in SMW-17, but the concentrations were below the ACL of 115 µg/L, which is protective of surface water. The concentrations fluctuate seasonally but generally decline over time. The concentrations in the previous five years ranged from below detection to 6.3 µg/L in July 2010; the most recent sample collected in October 2014 was 3.2 µg/L (Figure 5).

Figure 4: Monitoring Well Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding the EPA's response actions at the Site.

Figure 5: Benzene Concentrations in Upper Sand Aquifer Well SMW-17

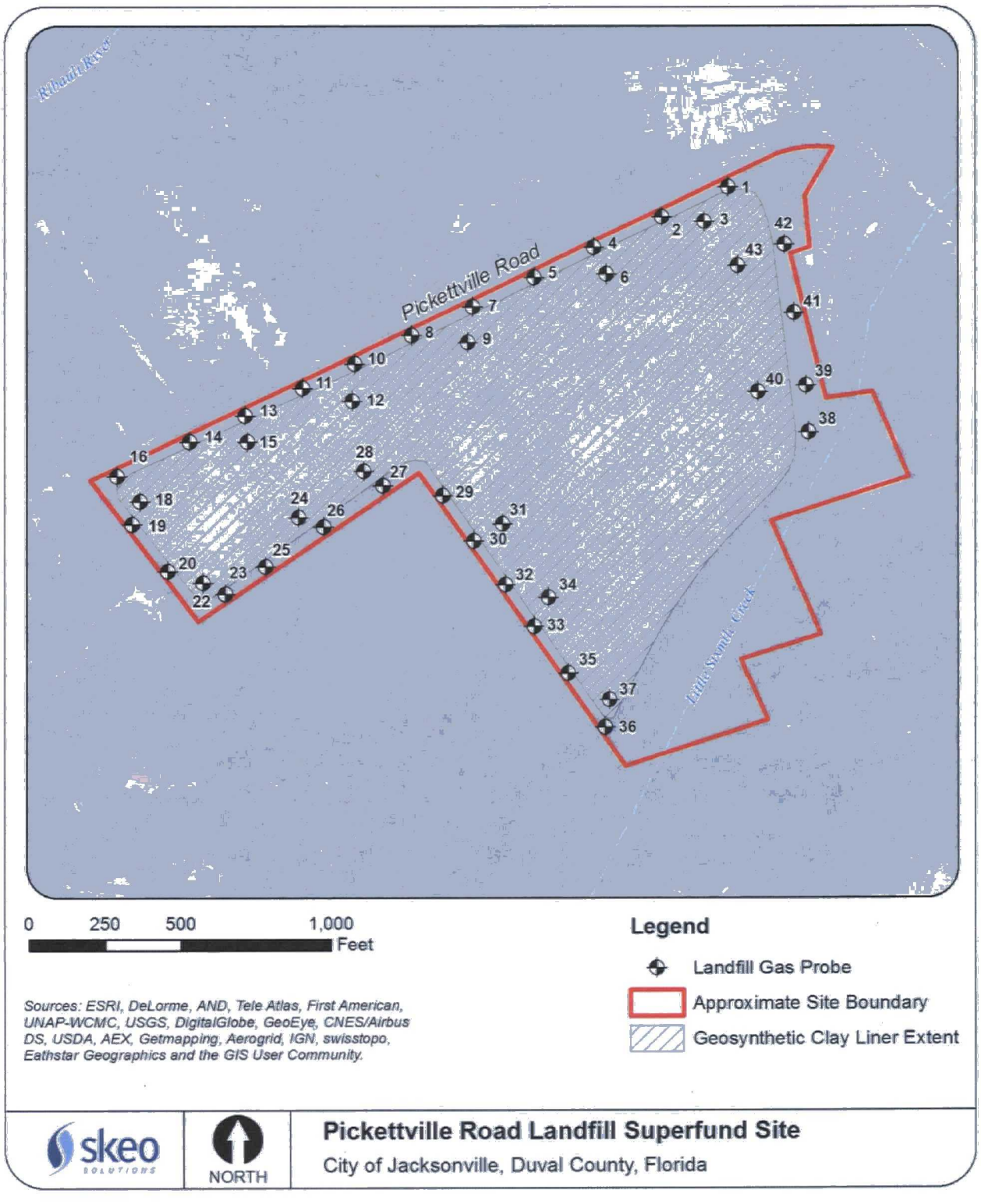


Despite MCL exceedances on site in the upper sand aquifer for arsenic, lead and benzene, exposure to groundwater is incomplete because institutional controls are in place restricting use of on-site groundwater (Section 6.3). The PRPs completed a groundwater/surface water interface study in 2008. The study concluded that arsenic did not exceed its MCL (50 µg/L was used at that time) in the groundwater/surface water interface with the Little Sixmile Creek. Based on the supplemental study and historical groundwater monitoring, the EPA approved the PCOR in late September 2008.

Landfill Gas

The gas collection trench extends along the landfill perimeter except for the side next to Little Sixmile Creek. The gas monitoring system consists of 41 gas probes (GP-1 to GP-43; based on field conditions, GP-17 and GP-21 were not installed). The PRPs installed probes about every 200 feet outside the trench, and every 400 feet inside the trench (Figure 6). The PRPs conduct landfill gas monitoring on a semi-annual basis. During these events, the PRPs sample gas probes for methane and inspect the landfill area for evidence of gas seepage, such as stressed vegetation, cracks in the surface layer, and unusual odors. A review of gas monitoring data from February 2011 to March 2015 indicates that the system is functioning as designed. Although several gas probes inside the gas collection trench had measurements above the lower explosive limit (LEL), measurements outside the gas collection trench were below the action level of 5 percent for methane. This indicates that gas is not migrating from the landfill. However, GP-42, located outside the gas collection trench, routinely had measurements above the LEL throughout the last five years. This probe is near former leaking underground storage tanks (USTs) at the LTPC property. The detections are likely associated with soil contamination from these USTs. This observation has been consistent since the first FYR.

Figure 6: Landfill Gas Probe Locations



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding the EPA's response actions at the Site.

6.5 Site Inspection

The EPA conducted a site inspection on April 28, 2015. Site inspection participants included: Scott Martin (EPA RPM), Kelsey Helton (FDEP), Don Miller (Golder Associates), Brian Price (Golder Associates) and Claire Marcussen (Skeo Solutions). Perimeter fencing surrounds the former facility property of the Site and a locked gate off of Pickettville Road controls access to the area. The gate was secured and locked. However, there was one area immediately west of the locked gate where the perimeter fence had been vandalized. There are signs along the perimeter fence, but many of the signs are illegible due to fading or are covered with vines. The sign at the main entry gate was illegible due to fading.

The landfill cover was in good condition with established grass covering the entire surface. Several shallow animal burrows were visible at depths less than 2 feet, which did not penetrate the cap. No trees or shrubs were observed on the landfill. A larger burrow was observed near the southwest perimeter of the Site, outside the landfill. All monitoring wells were in good condition and were secured with padlocks. Passive gas vents were in working condition. The cover was mowed and surface drainage features appeared clear of debris.

The EPA explained that discussions have taken place about future use of the Site for recreational purposes or for creating solar energy through solar panel arrays. However, no definitive plans have been made at this time. Appendices D and E include the site inspection checklist and photographs.

Skeo Solutions staff visited the designated site repository, Highlands Branch Public Library, located at 1826 Dunn Avenue, Jacksonville, Florida. The library did not contain any documents on the Pickettville Road Landfill Site and stated that any future documents should be sent as hard copy.

6.6 Interviews

The FYR process included interviews with the regulatory agencies involved in site activities and the O&M contractor for the Site. The purpose was to document the perceived status of the Site and any perceived problems or successes with the phases of the remedy implemented to date. All of the interviews took place electronically by sending the interview forms to attendees of the site inspection. The interviews are summarized below. Appendix C provides the complete interviews.

Don Miller: Mr. Miller works for Golder and Associates, Inc., a consulting firm retained by the PRPs to conduct O&M activities at the Site. He reported that the remedy has been successful and is functioning as designed because contaminated groundwater is not leaving the Site above the cleanup goals established in the ROD. Mr. Miller has not observed any significant changes in the O&M costs other than a slight increase in 2014 due to the hiring of a new mowing contractor. A decrease was also noted in 2012 when mowing was delayed due to very wet conditions.

7.0 Technical Assessment

7.1 Question A: Is the remedy functioning as intended by the decision documents?

The remedy appears to be functioning to address the two primary COCs: benzene and vinyl chloride. However, arsenic was the only other COC consistently above its MCL (10 µg/L) in more than one upper sand aquifer well during the previous five years. Institutional controls are in place that restrict the use of groundwater from the upper sand aquifer. These controls also restrict the use of the Site for residential, commercial or industrial uses, unless allowed by the Consent Decree. The 2011 FYR indicated that the groundwater remedy is not achieving cleanup goals in a reasonable timeframe. The EPA should evaluate whether the groundwater remedy should be optimized to reduce the timeframe for achieving the arsenic groundwater cleanup goal.

The landfill cover, stormwater management and gas control systems are regularly maintained. The Site is surrounded by fencing to prevent unauthorized access to the Site. However, a portion of the fence has been vandalized to allow trespassing near the main entrance gate along Pickettville Road. In addition, warning signs along Pickettville Road are illegible due to fading or heavy vegetation. Due to the presence of waste left in the landfill, site access controls require repair to ensure trespassers do not disturb the remedy and potentially become exposed to landfill waste. Restoration of Little Sixmile Creek is complete. A final ecological study indicated no ecological impacts from the Site and that further Site restoration was not necessary.

7.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels and remedial action objectives (RAOs) used at the time of remedy selection still valid?

The exposure assumptions, toxicity data and RAOs remain valid. However, the current MCLs for arsenic and lead are more stringent than the MCLs listed in the 1990 ROD. The EPA and FDEP have established MCLs for cyanide, nickel (state MCL only) and toluene. Except for arsenic, the PRPs have incorporated current MCLs into the long-term monitoring program. The PRPs consistently detect arsenic above the current MCL in SMW-4, SMW-9, SMW-10, SMW-18 and SMW-21. The groundwater remedy remains protective in the short term because engineering and institutional controls prevent groundwater exposure.

When remedial actions were developed for the Site, vapor intrusion (the migration of vapors from contaminated groundwater to the ground surface) was not considered. As more information on vapor intrusion has become available, the EPA has developed guidance for evaluating this exposure pathway when groundwater is contaminated with VOCs. The vapor intrusion pathway currently does not pose a significant risk at the Site because there are no occupied buildings on site, groundwater contamination is contained to the Site, and restrictions are in place preventing the construction of buildings that would disturb the remedial components. VOCs in the upper sand aquifer have declined over time. Most VOCs are below detection, but there are low-level detections of four VOCs in SMW10, SMW-17 and SMW-18. Based on a hypothetical future indoor air exposure at the Site, the current VOC groundwater data demonstrate that this exposure pathway does not pose a health concern based on a screening-level analysis (Appendix F).

7.3 Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No other information has come to light that could call into question the protectiveness of the remedy.

7.4 Technical Assessment Summary

The Site's remedy is operating and functioning as designed by the decision documents. The landfill cover, stormwater and gas control systems are regularly maintained. Institutional controls restrict land use and groundwater use. Although the PRPs have installed a fence to prevent unauthorized access to the Site, a portion of the fence had been vandalized near the main entrance gate. Several warning signs are illegible along Pickettville Road.

The exposure assumptions, toxicity data and RAOs remain valid. Except for arsenic, the PRPs have incorporated current drinking water standards into the long-term monitoring program. The groundwater remedy remains valid in the short term because engineering and institutional controls prevent groundwater exposure. However, to ensure remedy effectiveness is properly monitored, the current MCL for arsenic should be used in the long-term monitoring program. The PRPs consistently detect arsenic above the current MCL in five monitoring wells.

8.0 Issues, Recommendations and Follow-up Actions

None.

9.0 Protectiveness Statements

Table 10: Protectiveness Statement

Sitewide Protectiveness Statement
Protectiveness Determination: Short-term Protective
Protectiveness Statement: The Site's remedy currently protects human health and the environment because waste material has been excavated from Little Sixmile Creek and residual contamination is contained beneath a landfill cover system. Restrictions are in place to prevent groundwater use and future land uses that could damage the remedial components. For the remedy to remain protective over the long term, issues concerning O&M and remedy performance should be addressed.

10.0 Next Review

The next FYR will be due within five years of the signature/approval date of this FYR.

Appendix A: List of Documents Reviewed

CERCLA Information System Site Information accessed from website http://www.epa.gov/region4/superfund/sites/npl/florida/pickrlffl.html. Accessed April 21, 2015.

EPA Record of Decision: Pickettville Road Landfill EPAID: FLD980556351. Prepared by U.S. EPA Region 4. September 28, 1990.

Explanation of Significant Differences. Pickettville Road Superfund Site, Jacksonville, Duval County, FL. Prepared by U.S. EPA Region 4. March 1996.

Focused Feasibility Study, Pickettville Road Landfill Site, Jacksonville, Florida. Prepared by Golder Associates, Inc. April 2003.

Groundwater Monitoring Report, O&M Sampling Event, 2013 Annual Groundwater Monitoring Report, Pickettville Road Landfill Site. Prepared by Golder Associates, Inc. March 2015.

Preliminary Close Out Report. Pickettville Road Landfill, Jacksonville, Duval County, Florida. Prepared by U.S. EPA Region 4. September 2008.

Revised Groundwater Monitoring Plan Pickettville Road Landfill Site, Jacksonville, Florida. Prepared by Golder Associates, Inc. June 1993.

Revised Remediation Goal Verification Plan, Pickettville Road Landfill Site, Jacksonville, Florida. Prepared by Golder Associates, Inc. February 1994.

Results of Evaluation of Arsenic in Groundwater Surface Water Interface, Little Sixmile Creek. Pickettville Road Landfill Site, Jacksonville, Florida. Prepared by Golder Associates, Inc. September 2008.

Remedial Action Report, Pickettville Road Landfill Site, Jacksonville, Florida. Prepared by Golder Associates, Inc. March 1997.

Second Five-Year Review Report for Pickettville Road Landfill Superfund Site, Jacksonville, Duval County, Florida. Prepared for U.S. EPA Region 4. January 2006.

First Five-Year Review Report, Pickettville Road Landfill, Jacksonville, Duval County, Florida. Prepared by U.S. Army Corps of Engineers. September 1999.

Appendix B: Press Notice

The U. S. Environmental Protection Agency, Region 4
Announces the Fourth Five-Year Review for the Pickettville Road Landfill Superfund Site
Jacksonville, Duval County, Florida

Purpose/Objective: The EPA is conducting the fourth Five-Year Review of the remedy for the Pickettville Road Landfill Superfund site (the Site) in Jacksonville, Florida. The purpose of the Five-Year Review is to make sure selected cleanup actions effectively protect human health and the environment.

Site Background: The 52-acre area is located five miles northwest of downtown Jacksonville. In the 1940s, borrow pit operations for sand and limited disposal activities began at the site property. During this time, disposal wastes included waste oil, lead-acid battery liquid waste, battery casings, light terpene sludge and polychlorinated biphenyls. In 1968, the City of Jacksonville leased the site property and started full-scale landfill operations. The landfill accepted all types of waste. In 1971, municipal wastes were sent to other landfills and the landfill served as a hazardous waste disposal facility. Routine inspections by Duval County's Department of Health and Welfare between 1975 and 1976 identified inadequate waste disposal and maintenance practices. Landfill operations ceased in July 1977. The EPA sampled groundwater, surface water, soil and leachate, and identified metals and volatile organic compounds in soil and groundwater. The EPA then listed the Site on the Superfund program's National Priorities List in September 1983.

Cleanup Actions: The EPA selected the final remedy to address contaminated soil and groundwater in the Site's 1990 Record of Decision. It consisted of restricting site access, groundwater use and future site redevelopment; plugging and abandoning water supply wells; extending the municipal water supply as an alternative drinking water source; installing a cover system; restoring Little Six-Mile Creek; and conducting operation and maintenance activities. All remedy construction activities finished in September 2008. Groundwater and landfill gas monitoring is ongoing.

Five-Year Review Schedule: The National Contingency Plan requires review of remedial actions that result in any hazardous substances, pollutants or contaminants remaining at a site above levels that allow for unlimited use and unrestricted exposure every five years to ensure the protection of human health and the environment. The fourth of the Five-Year Reviews for the Site will be completed by November 2015.

The EPA Invites Community Participation in the Five-Year Review Process: The EPA is conducting this Five-Year Review to evaluate the effectiveness of the site remedy and to ensure that the remedy remains protective of human health and the environment. As part of the Five-Year Review process, EPA staff members are available to answer any questions about the Site. Community members

who have questions about the Site or the Five-Year Review process, or who would like to participate in a community interview, are asked to contact:

Scott Martin, Remedial Project Manager
Phone: (404) 562-8916
Email: martin.scott@epa.gov

L'Tonya Spencer, Community Involvement Coordinator
Phone: (404) 562-8463 | (877) 718-3752 (toll free)
Email: spencer.latonya@epa.gov

Mailing Address: U.S. EPA Region 4, 61 Forsyth St. S.W., Atlanta, GA 30303-8960

Additional information is available at the Site's document repository, located at the Highlands Regional Branch of the Jacksonville Public Library, 1826 Dunn Avenue, Jacksonville, Florida 32218, and online at: *http://www.epa.gov/region4/superfund/sites/npl/florida/pickrlffl.html*

Appendix C: Interview Forms

Pickettville Road Landfill Superfund Site		Five-Year Review Interview Form	
Site Name:	Pickettville Road Landfill	**EPA ID No.:**	FLD980556351
Interviewer Name:	Claire Marcussen	**Affiliation:**	Skeo Solutions
Subject Name:	Don Miller	**Affiliation:**	Golder and Associates, Inc.
Time:	9:50 a.m.	**Date:**	04/28/2015
Interview Location:	Email response		

Interview Format (circle one): In Person Phone Mail Other: Email

Interview Category: PRP O&M Contractor

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?

   Landfill in West Jacksonville in an industrial area. Maintenance does not create a hardship and no complaints have been received from surrounding neighborhood.

2. What is your assessment of the current performance of the remedy in place at the Site?

   Remedy is protective as contaminants above the ARARs (set forth in the ROD) are not emanating from the Site. Maintenance is performed on schedule and there is little difficulty with that. Excessive rain, when it occurs, causes soggy conditions at the Site, which may delay execution of O&M activities, but when the Site dries sufficiently then access is not an issue.

3. What are the findings from the monitoring data? What are the key trends in contaminant levels that are being documented over time at the Site?

   Monitoring information has been provided to Skeo and this assessment is being performed by the Skeo team. There are no VOC detections above the MCL and the analysis of non-metallic general landfill parameters are within the ranges typically observed for landfills. There is no off-site contamination emanating from the Site.

4. Please describe staff responsibilities and the frequency of O&M-related site inspections and activities.

   O&M is performed on a semi-annual basis and includes walking the Site and inspecting the berms, fence, cover, looking for erosion/ mowing, gas monitoring and groundwater monitoring.

5. Have there been any significant changes in site O&M requirements, maintenance schedules in the last five years? If so, do they affect the protectiveness or effectiveness of the remedy? Please describe changes and impacts.

   No. The schedule has been shifted from January/July to April/October, but this has not affected the overall remedy.

6. Have there been unexpected O&M difficulties or costs at the Site in the last five years (please provide general summary of costs in table below)? If so, please provide details.

Annual O&M Costs

Date Range	Total Cost *(rounded to the nearest $1,000)*
August through July 2010	$32,000
August through July 2011	$50,000
August through July 2012	$21,000[a]
August through July 2013	$51,000
August through July 2014	$60,000[b]

Notes:
c. Lower costs as a sampling event was postponed due to adverse (soggy) site conditions and mowing could not be performed without damaging the cover
d. Increased costs as the mowing costs have increased significantly when subcontractor was changed. Original subcontractor went out of business and a new one had to be found.

7. Have there been opportunities to optimize O&M activities or sampling efforts? Please describe changes and any resulting or desired cost savings or improved efficiencies.

   R*eport currently being prepared will include a section discussing trends in data and a proposal will be made to reduce the sampling program by possible eliminating parameters or monitoring points. This will help reduce O&M costs.*

8. Has an evaluation been conducted in the past five years to determine if continuing with the long-term monitored natural attenuation program for contaminated ground water is the best path forward? If so, please provide details. If not, please explain the reason(s) for not conducting the evaluation.

   No, an evaluation has not been performed. Intermittent exceedances of ARARs still occur in on-site wells, but there is no defined plume that has developed and contaminants are not present at levels above ARARs in off-site wells.

9. Do you have any comments, suggestions or recommendations regarding O&M activities and schedules at the Site?

   O&M should continue with a reduction in the groundwater monitoring program to be proposed in the upcoming annual report.

Appendix D: Site Inspection Checklist

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST

I. SITE INFORMATION

Site Name: Pickettville Road Landfill	**Date of Inspection: April 28, 2015**
Location and Region: Jacksonville, FL/EPA Region 4	**EPA ID: FLD980556351**
Agency, Office or Company Leading the Five-Year Review: EPA Region 4	**Weather/Temperature:** Cloud/overcast, 70 degrees F

Remedy Includes: (Check all that apply)

- ☒ Landfill cover/containment
- ☒ Access controls
- ☒ Institutional controls
- ☐ Ground water pump and treatment
- ☐ Surface water collection and treatment
- ☐ Other: _____
- ☒ Monitored natural attenuation
- ☐ Ground water containment
- ☐ Vertical barrier walls

Attachments: ☐ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (check all that apply)

1. **O&M Site Manager** Don Miller (Name) Senior Consultant (Title) _____ (Date)
   Interviewed ☐ at site ☒ at office ☐ by phone : 904-363-3430
   Problems, suggestions ☐ Report attached: _____

2. **O&M Staff** Brian Price (Name) _____ (Title) _____ (Date)
   Interviewed ☐ at site ☒ at office ☐ by phone : 904-363-3430
   Problems/suggestions ☐ Report attached: _____

3. **Local Regulatory Authorities and Response Agencies** (i.e., state and tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices). Fill in all that apply.

   Agency EPA Region 4
   Contact Scott Martin (Name) Regional Project Manager (Title) _____ (Date) 404-562-8916 (Phone No.)
   Problems/suggestions ☐ Report attached: _____

   Agency Florida Department of Environmental Protection
   Contact Kelsey Helton, P.G. (Name) Project Manager (Title) _____ (Date) 850-245-8927 (Phone No.)
   Problems/suggestions ☐ Report attached: _____

   Agency _____
   Contact _____ (Name) _____ (Title) _____ (Date) _____ (Phone No.)
   Problems/suggestions ☐ Report attached: _____

   Agency _____

Contact _____ _____ _____ _____
Name Title Date Phone No.
Problems/suggestions ☐ Report attached: _____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone No.
Problems/suggestions ☐ Report attached: _____

4. **Other Interviews** (optional) ☐ Report attached: _____

III. ON-SITE DOCUMENTS AND RECORDS VERIFIED (check all that apply)

1. **O&M Documents**

☐ O&M manual	☒ Readily available	☒ Up to date	☐ N/A
☐ As-built drawings	☐ Readily available	☐ Up to date	☒ N/A
☐ Maintenance logs	☒ Readily available	☒ Up to date	☐ N/A

Remarks: _____

2. **Site-Specific Health and Safety Plan**	☒ Readily available	☒ Up to date	☐ N/A
☒ Contingency plan/emergency response plan	☒ Readily available	☒ Up to date	☐ N/A

Remarks: _____

3. **O&M and OSHA Training Records**	☐ Readily available	☐ Up to date	☒ N/A

Remarks: _____

4. **Permits and Service Agreements**

☐ Air discharge permit	☐ Readily available	☐ Up to date	☒ N/A
☐ Effluent discharge	☐ Readily available	☐ Up to date	☒ N/A
☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	☒ N/A
☐ Other permits: _____	☐ Readily available	☐ Up to date	☒ N/A

Remarks: _____

5. **Gas Generation Records**	☐ Readily available	☐ Up to date	☒ N/A

Remarks: _____

6. **Settlement Monument Records**	☐ Readily available	☐ Up to date	☒ N/A

Remarks: _____

7. **Ground Water Monitoring Records**	☒ Readily available	☒ Up to date	☐ N/A

Remarks: _____

8. **Leachate Extraction Records**	☐ Readily available	☐ Up to date	☒ N/A

Remarks: _____

9. **Discharge Compliance Records**

☐ Air	☐ Readily available	☐ Up to date	☒ N/A
☐ Water (effluent)	☐ Readily available	☐ Up to date	☒ N/A

Remarks: _____

10. **Daily Access/Security Logs** ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

IV. O&M COSTS

1. **O&M Organization**

☐ State in-house ☐ Contractor for state

☐ PRP in-house ☐ Contractor for PRP

☐ Federal facility in-house ☐ Contractor for Federal facility

☒ Golder and Associates

2. **O&M Cost Records**

☒ Readily available ☒ Up to date

☐ Funding mechanism/agreement in place ☐ Unavailable

Original O&M cost estimate: $70,000/year on average ☐ Breakdown attached

Total annual cost by year for review period if available

From: 1/1/2010 Date	To: 7/1/2010 Date	$32,000 Total cost	☐ Breakdown attached
From: 1/1/2011 Date	To: 7/1/2011 Date	$50,000 Total cost	☐ Breakdown attached
From: 1/1/2012 Date	To: 7/1/2012 Date	$21,000 Total cost	☐ Breakdown attached
From: 1/1/2013 Date	To: 7/1/2013 Date	$51,000 Total cost	☐ Breakdown attached
From: 4/1/2014 Date	To: 10/1/2014 Date	$60,000 Total cost	☐ Breakdown attached

3. **Unanticipated or Unusually High O&M Costs during Review Period**

Describe costs and reasons: Lower costs occurred in 2012 because mowing could not occur due to soggy conditions. Costs increased in 2014 due to change in subcontractors for mowing.

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

A. Fencing

1. **Fencing Damaged** ☐ Location shown on site map ☒ Gates secured ☐ N/A

Remarks: Immediately west of the entrance, the fence was folded back half-way. The O&M contractor noted the issue and will repair it. Otherwise, the remaining portions of the perimeter fence were intact and all gates locked.

B. Other Access Restrictions

1. **Signs and Other Security Measures** ☐ Location shown on site map ☐ N/A

Remarks: Signage is posted along the perimeter fence. Many of the signs that identify the Site as a Superfund site are faded and not legible or vegetation has grown over them.

C. Institutional Controls (ICs)

1. **Implementation and Enforcement**

Site conditions imply ICs not properly implemented ☐ Yes ☒ No ☐ N/A

Site conditions imply ICs not being fully enforced ☐ Yes ☒ No ☐ N/A

Type of monitoring (e.g., self-reporting, drive by): _____

Frequency: _____

Responsible party/agency: _____

Contact _____ _____ _____ _____

Name Title Date Phone no.

Reporting is up to date ☐ Yes ☐ No ☐ N/A

Reports are verified by the lead agency ☐ Yes ☐ No ☐ N/A

Specific requirements in deed or decision documents have been met ☐ Yes ☐ No ☐ N/A

Violations have been reported ☐ Yes ☐ No ☐ N/A

Other problems or suggestions: ☐ Report attached

2. **Adequacy** ☒ ICs are adequate ☐ ICs are inadequate ☐ N/A

Remarks: The institutional controls in place prevent any construction or access to the Site that would result in the creation of an exposure pathway.

D. General

1. **Vandalism/Trespassing** ☐ Location shown on site map ☐ No vandalism evident

Remarks: The fence has been damaged immediately west of the main entrance gate.

2. **Land Use Changes On Site** ☒ N/A

Remarks: _____

3. **Land Use Changes Off Site** ☒ N/A

Remarks: _____

VI. GENERAL SITE CONDITIONS

A. Roads ☒ Applicable ☐ N/A

1. **Roads Damaged** ☐ Location shown on site map ☒ Roads adequate ☐ N/A

Remarks: _____

B. Other Site Conditions

Remarks: _____

VII. LANDFILL COVERS ☒ Applicable ☐ N/A

A. Landfill Surface

1. **Settlement** (low spots) ☐ Location shown on site map ☒ Settlement not evident

Arial extent: _____ Depth: _____

Remarks: _____

2.	**Cracks**	☐ Location shown on site map	☒ Cracking not evident
	Lengths: _____	Widths: _____	Depths: _____
	Remarks: _____		
3.	**Erosion**	☐ Location shown on site map	☒ Erosion not evident
	Arial extent: _____		Depth: _____
	Remarks: _____		
4.	**Holes**	☐ Location shown on site map	☐ Holes not evident
	Arial extent: Several burrows were observed on site		Depth: Less than 2 feet in depth
	Remarks: It appears that animals try and burrow as there were sporadic indentations less than 6 inches deep across the landfill; only one larger burrow was observed that was less than 2 feet in depth but was located outside the landfill cap.		
5.	**Vegetative Cover**	☒ Grass	☒ Cover properly established
	☒ No signs of stress	☐ Trees/shrubs (indicate size and locations on a diagram)	
	Remarks: Cover was vegetated and no trees or shrubs were growing on the landfill.		
6.	**Alternative Cover** (e.g., armored rock, concrete)		☒ N/A
	Remarks: _____		
7.	**Bulges**	☐ Location shown on site map	☒ Bulges not evident
	Arial extent: _____		Height: _____
	Remarks: _____		
8.	**Wet Areas/Water Damage**	☒ Wet areas/water damage not evident	
	☐ Wet areas	☐ Location shown on site map	Arial extent: _____
	☐ Ponding	☐ Location shown on site map	Arial extent: _____
	☐ Seeps	☐ Location shown on site map	Arial extent: _____
	☐ Soft subgrade	☐ Location shown on site map	Arial extent: _____
	Remarks: Water was present in the stormwater runoff features, such as Pond 1 and Pond 2, and there were small puddles in the drainage swales surrounding the perimeter of the Site.		
9.	**Slope Instability**	☐ Slides	☐ Location shown on site map
	☒ No evidence of slope instability		
	Arial extent: _____		
	Remarks: _____		
B. Benches		☐ Applicable	☒ N/A
	(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)		
1.	**Flows Bypass Bench**	☐ Location shown on site map	☐ N/A or okay
	Remarks: _____		
2.	**Bench Breached**	☐ Location shown on site map	☐ N/A or okay

Remarks: _____

3. **Bench Overtopped** ☐ Location shown on site map ☐ N/A or okay

Remarks: _____

C. Letdown Channels ☒ Applicable ☐ N/A

(Channel lined with erosion control mats, riprap, grout bags or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** (Low spots) ☐ Location shown on site map ☒ No evidence of settlement

Arial extent: _____ Depth: _____

Remarks: _____

2. **Material Degradation** ☐ Location shown on site map ☒ No evidence of degradation

Material type:_____ Arial extent: _____

Remarks: _____

3. **Erosion** ☐ Location shown on site map ☒ No evidence of erosion

Arial extent: _____ Depth: _____

Remarks: _____

4. **Undercutting** ☐ Location shown on site map ☒ No evidence of undercutting

Arial extent: _____ Depth: _____

Remarks: _____

5. **Obstructions** Type: _____ ☒ No obstructions

☐ Location shown on site map Arial extent: _____

Size: _____

Remarks: _____

6. **Excessive Vegetative Growth** Type: _____

☒ No evidence of excessive growth

☐ Vegetation in channels does not obstruct flow

☐ Location shown on site map Arial extent: _____

Remarks: _____

D. Cover Penetrations ☒ Applicable ☐ N/A

1. **Gas Vents** ☐ Active ☒ Passive

☒ Properly secured/locked ☒ Functioning ☐ Routinely sampled ☒ Good condition

☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A

Remarks: _____

2. **Gas Monitoring Probes**

☒ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition

☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A

Remarks: _____

3. **Monitoring Wells** (within surface area of landfill)

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ Evidence of leakage at penetration ☐ Needs maintenance ☒ N/A

Remarks: _____

4. **Extraction Wells Leachate**

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ Evidence of leakage at penetration ☐ Needs maintenance ☒ N/A

Remarks: _____

5. **Settlement Monuments** ☐ Located ☐ Routinely surveyed ☒ N/A

Remarks: _____

E. Gas Collection and Treatment ☐ Applicable ☒ N/A

1. **Gas Treatment Facilities**

☐ Flaring ☐ Thermal destruction ☐ Collection for reuse

☐ Good condition ☐ Needs maintenance

Remarks: _____

2. **Gas Collection Wells, Manifolds and Piping**

☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Gas Monitoring Facilities** (e.g., gas monitoring of adjacent homes or buildings)

☐ Good condition ☐ Needs maintenance ☐ N/A

Remarks: _____

F. Cover Drainage Layer ☐ Applicable ☒ N/A

1. **Outlet Pipes Inspected** ☐ Functioning ☐ N/A

Remarks: _____

2. **Outlet Rock Inspected** ☐ Functioning ☐ N/A

Remarks: _____

G. Detention/Sedimentation Ponds ☐ Applicable ☒ N/A

1. **Siltation** Area extent: _____ Depth: _____ ☐ N/A

☐ Siltation not evident

Remarks: _____

2. **Erosion** Area extent: _____ Depth: _____

☐ Erosion not evident

Remarks: _____

3. **Outlet Works** ☐ Functioning ☐ N/A

Remarks: _____

4. **Dam** ☐ Functioning ☐ N/A

Remarks: _____

H. Retaining Walls ☐ Applicable ☒ N/A

1. **Deformations** ☐ Location shown on site map ☐ Deformation not evident

Horizontal displacement: _____ Vertical displacement: _____

Rotational displacement: _____

Remarks: _____

2. **Degradation** ☐ Location shown on site map ☐ Degradation not evident

Remarks: _____

I. Perimeter Ditches/Off-Site Discharge ☒ Applicable ☐ N/A

1. **Siltation** ☐ Location shown on site map ☒ Siltation not evident

Area extent: _____ Depth: _____

Remarks: _____

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A

☒ Vegetation does not impede flow

Area extent: _____ Type: _____

Remarks: _____

3. **Erosion** ☐ Location shown on site map ☒ Erosion not evident

Area extent: _____ Depth: _____

Remarks: _____

4. **Discharge Structure** ☒ Functioning ☐ N/A

Remarks: Concrete swale and collection area on the south side of the Site was dry and in good condition.

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☒ N/A

1. **Settlement** ☐ Location shown on site map ☐ Settlement not evident

Area extent: _____ Depth: _____

Remarks: _____

2. **Performance Monitoring** Type of monitoring: _____

☐ Performance not monitored

Frequency: _____ ☐ Evidence of breaching

Head differential: _____

Remarks: _____

IX. GROUND WATER/SURFACE WATER REMEDIES ☒ Applicable ☐ N/A

A. Ground Water Extraction Wells, Pumps and Pipelines ☐ Applicable ☒ N/A

1. **Pumps, Wellhead Plumbing and Electrical**

☐ Good condition ☐ All required wells properly operating ☐ Needs maintenance ☐ N/A

Remarks: _____

2. **Extraction System Pipelines, Valves, Valve Boxes and Other Appurtenances**

☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Spare Parts and Equipment**

☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided

Remarks: _____

B. Surface Water Collection Structures, Pumps and Pipelines ☐ Applicable ☒ N/A

1. **Collection Structures, Pumps and Electrical**

☐ Good condition ☐ Needs maintenance

Remarks: _____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes and Other Appurtenances**

☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Spare Parts and Equipment**

☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided

Remarks: _____

C. Treatment System ☐ Applicable ☒ N/A

1. **Treatment Train** (check components that apply)

☐ Metals removal ☐ Oil/water separation ☐ Bioremediation

☐ Air stripping ☐ Carbon adsorbers

☐ Filters: _____

☐ Additive (e.g., chelation agent, flocculent): _____

☐ Others: _____

☐ Good condition ☐ Needs maintenance

☐ Sampling ports properly marked and functional

☐ Sampling/maintenance log displayed and up to date

☐ Equipment properly identified

☐ Quantity of ground water treated annually: _____

☐ Quantity of surface water treated annually: _____

Remarks: _____

2. **Electrical Enclosures and Panels** (properly rated and functional)

☐ N/A ☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Tanks, Vaults, Storage Vessels**

☐ N/A ☐ Good condition ☐ Proper secondary containment ☐ Needs maintenance

Remarks: _____

4. **Discharge Structure and Appurtenances**

☐ N/A ☐ Good condition ☐ Needs maintenance

Remarks: _____

5. **Treatment Building(s)**

☐ N/A ☐ Good condition (esp. roof and doorways) ☐ Needs repair

☐ Chemicals and equipment properly stored

Remarks: _____

6. **Monitoring Wells** (pump and treatment remedy)

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ All required wells located ☐ Needs maintenance ☐ N/A

Remarks: _____

D. Monitoring Data

1. **Monitoring Data**

☒ Is routinely submitted on time ☐ Is of acceptable quality

2. **Monitoring Data Suggests:**

☒ Ground water plume is effectively contained ☒ Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

☒ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition

☒ All required wells located ☐ Needs maintenance ☐ N/A

Remarks: _____

X. OTHER REMEDIES

If there are remedies applied at the site and not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is designed to accomplish (e.g., to contain contaminant plume, minimize infiltration and gas emissions).

The selected remedy continues to function as designed. The capped portion of the Site remains functional, institutional controls are in place to prevent use that would result in the creation of an exposure pathway or disrupt the remedy in place.

B. Adequacy of O&M

	Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy. O&M at the Site remains adequate to maintain the vegetative cover and proper drainage. The monitoring wells, gas vents and gas probes were all found to be in working condition. Any breaches in the fence or animal burrows are address as needed during O&M inspections.
C.	**Early Indicators of Potential Remedy Problems**
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future. No unexpected O&M costs have been identified.
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. Vinyl chloride concentrations have continued to decline. However, the reducing conditions under the cap have been the likely cause of arsenic concentrations in several downgradient wells that exceed the current MCL of 10 µg/L. However, groundwater/surface water interface studies conducted in 2008 demonstrated that arsenic is not reaching Sixmile Creek and the levels remain steady on site.

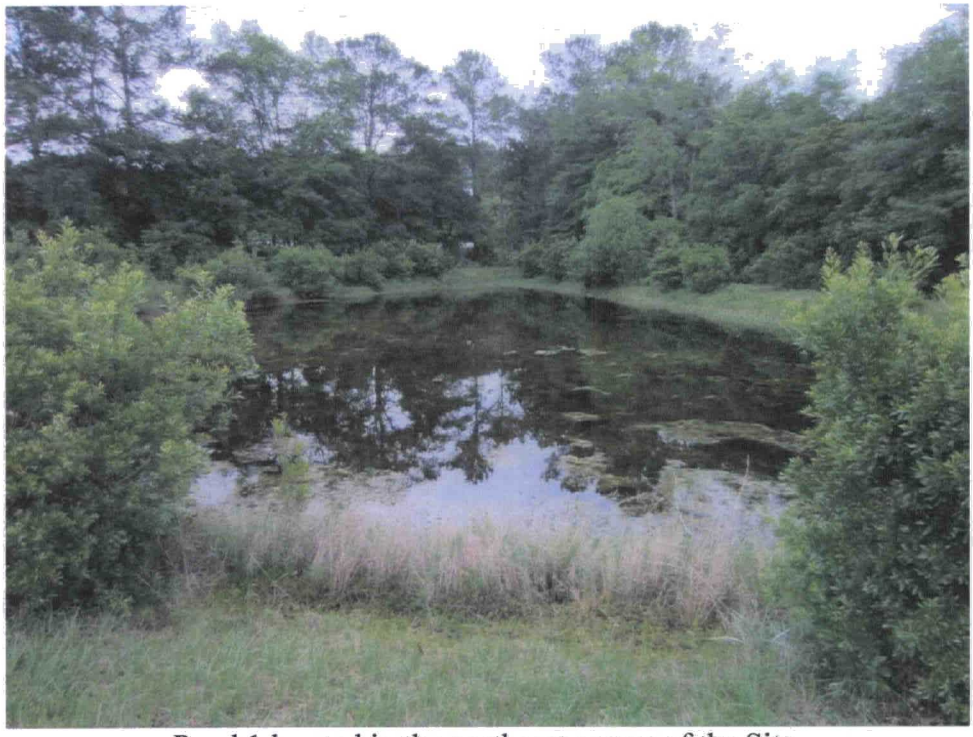
Appendix E: Photographs from Site Inspection

Locked entry gate with illegible warning sign.

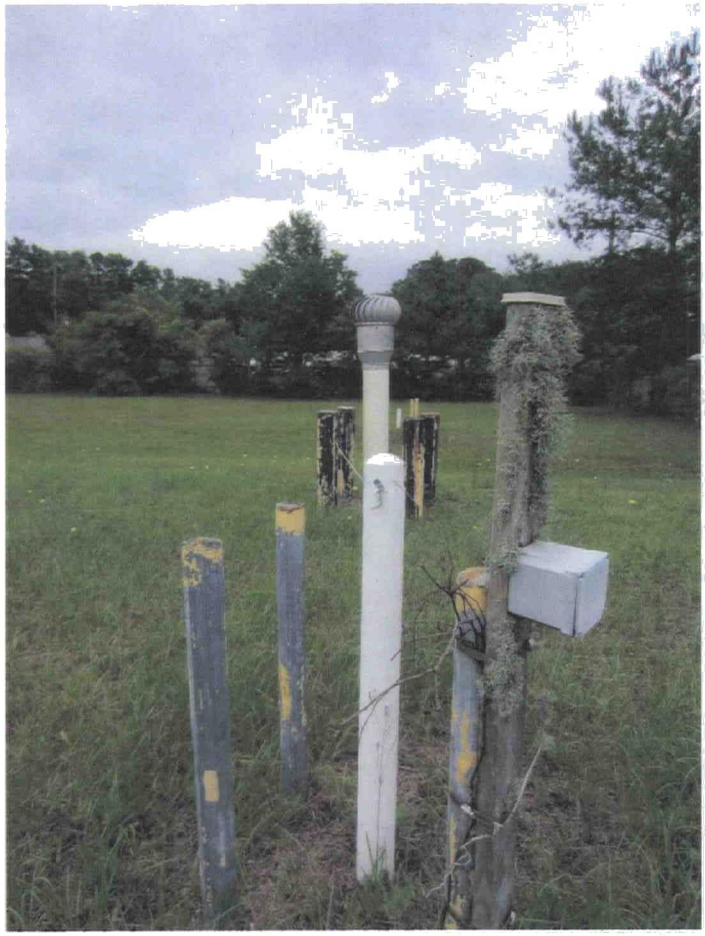
Passive gas vent on the landfill.

Vegetation blocking sign on perimeter fence.

Damaged portion of fence west of main entrance gate.



Pond 1 located in the northeast corner of the Site.



Gas sampling probe in the foreground and passive gas vent in the background.

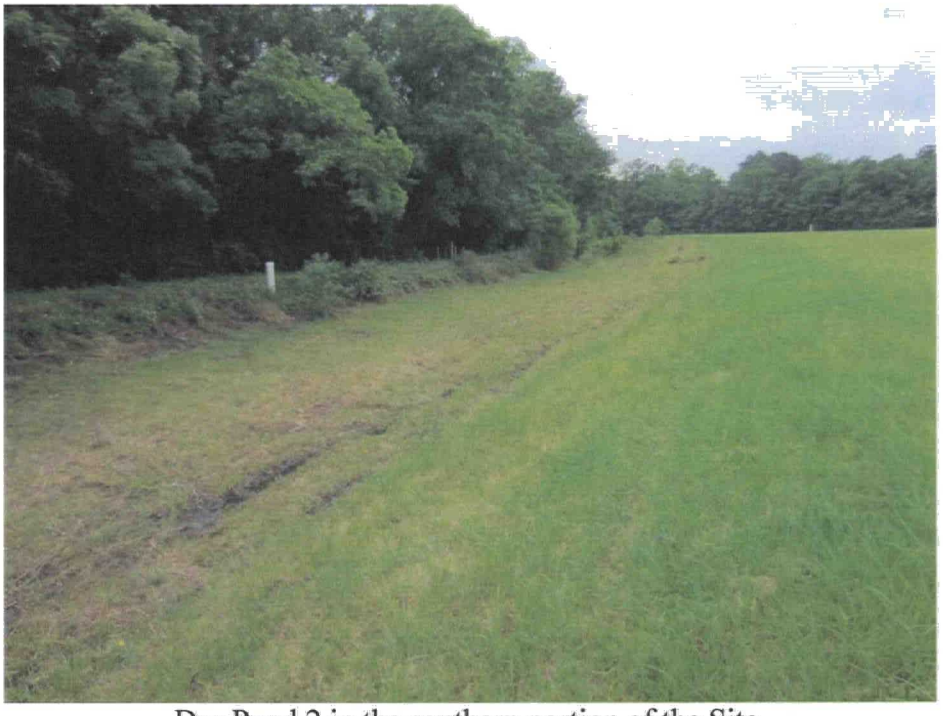
View of landfill surface looking southwest.

Stormwater 24-inch riser pipe overflow structure located near Pond 2.

Secured monitoring well cluster 18 (SMW-18 and DMW-18).

View of Sixmile Creek south of monitoring well cluster 18.

Concrete spillway south of Pond 2.



Dry Pond 2 in the southern portion of the Site.

View of the passive gas vents along the southwest perimeter of the Site.

Burrow along the southwest perimeter of the Site but not in the landfill.

View of landfill cover looking east.

View of residence located along the western border and upgradient of the Site.

Appendix F: Risk Assessment Support to Answer Question B (Section 7.2)

Since the ROD and ESD were published, the EPA's standardized risk assessment methodology has been revised to require a vapor intrusion pathway evaluation using multiple lines of evidence for sites where VOCs are detected in the subsurface. This FYR conducted a screening-level vapor intrusion evaluation using the EPA's 2014 Vapor Intrusion Screening Level (VISL) calculator to determine if the volatile groundwater COCs detected in site groundwater require further evaluation.

Currently, no buildings are present on the Site and institutional controls are in place that prohibit construction of buildings on the Site. In addition, the maximum concentrations of volatile COCs detected in 2014 were used in the VISL calculator with default assumptions for residential exposure. As shown in Table F-1, the screening level cumulative cancer risk is within the EPA's risk management range of 1×10^{-6} to 1×10^{-4} and the hazard quotients (HQs) are below the EPA's threshold of 1.0.

The screening level evaluation of vapor intrusion assumes the maximum detection of each VOC is present throughout the Site, which is conservative because VOCs are detected in only three wells. This suggests that there is not a significant VOC source at the Site. These results support that currently the vapor intrusion pathway does not pose significant risks. However, if long-term monitoring demonstrates any increases in concentrations, this pathway should be re-evaluated using multiple lines of evidence.

Table F-1: Screening Level Vapor Intrusion Risk Evaluation

COC	Maximum Upper Sand Well Concentration Detected in October 2014 (µg/L)	2014 VISL Calculator[a]	
		Residential	
		Cancer Risk	Noncancer HQ
Benzene	3.2 (SMW-17)	2.0×10^{-6}	0.02
Chlorobenzene	4.3 (SMW-18)	NA	0.01
Dichloroethane, 1,1-	13 (SMW-10)	1.7×10^{-6}	NA
Dichloroethene, 1,1-	7.1 (SMW-10)	NA	0.04
Vinyl chloride	1.6 (SMW-17)	1.1×10^{-5}	0.02
	Cumulative Total	1.5×10^{-5}	0.09

a. VISL calculator obtained on 5/20/15 at http://www.epa.gov/oswer/vaporintrusion/guidance.html
NA – toxicity value not established to calculated a cancer risk or noncancer HQ

Appendix G: Summary of O&M Costs Over the 20-Year Monitoring Period

AUGUST 1999

TABLE 1

ESTIMATED ANNUAL AND MAINTENANCE COSTS

(COSTS IN THOUSANDS OF DOLLARS)

	Fence Repair	Gate Replacement	Erosion Repair	Grass Mowing	Cover Maintenance	GW System Maintenance	Well Replacement	Gas System Maintenance	GW Sampling & Piezometers	Analytical (indicators)	Analytical (pest/PCBs)	Analytical (QA/QC)	Analytical (Trip Blank)	Well Decommissioning	GW Reporting	Gas Monitoring	Gas Probe Replacement	Gas Decommissioning	Reporting Quart/Annual	Site inspections	Administration	Certification	Five Year Review	EPA Oversight	SW Monitoring	TOTAL COST	PRESENT WORTH (3%)	ACTUAL COSTS (see note)
YEAR																												
1	2.4	0	0	10	0	1	0	2.5	15	35	5	6	1.1	0	10.5	2.5	0	0	7.5	2.5	10	0	0	20	0	131	127.2	137
2	2.4	0	45.5	10	15	1	10	2.5	8.5	22	2.5	6	1.1	0	10.5	2.5	5	0	7.5	2.5	10	0	0	20	2	186.5	175.8	112
3	2.4	0	45.5	10	15	1	0	2.5	8.5	22	2.5	6	1.1	2	10.5	2.5	0	0	7.5	2.5	10	0	0	20	0	171.5	156.9	
4	2.4	0	45.5	10	15	1	10	2.5	6	16	0	3	0.5	0	6	1.2	5	0	7.5	2.5	10	0	0	20	0	164.1	145.8	
5	2.4	0	45.5	10	15	1	0	2.5	6	16	0	3	0.5	0	6	1.2	0	0	7.5	2.5	10	0	50	20	0	199.1	171.7	
6	2.4	0	23	10	10	1	10	2.5	6	16	0	3	0.5	0	6	1.2	5	0	7.5	2.5	10	0	0	20	0	136.6	114.4	
7	2.4	0	23	10	10	1	0	2.5	6	16	0	3	0.5	0	6	1.2	0	0	7.5	2.5	10	0	0	20	0	121.6	98.9	
8	2.4	0	23	10	10	1	10	2.5	6	16	0	3	0.5	0	6	1.2	5	0	7.5	2.5	10	0	0	20	0	136.6	107.8	
9**	2.4	0	11.5	10	5	1	0	2.5	6	16	0	3	0.5	0	6	1.2	0	0	7.5	2.5	10	0	0	20	0	105.1	80.5	
10	2.4	1.5	11.5	10	5	1	10	2.5	6	16	0	3	0.5	0	6	1.2	5	0	7.5	2.5	10	0	50	20	0	171.6	127.7	
11	2.4	0	11.5	10	5	1	0	2.5	6	16	0	3	0.5	0	6	1.2	0	0	7.5	2.5	10	0	0	10	0	95.1	68.7	
12	2.4	0	11.5	10	5	1	10	2.5	6	16	0	3	0.5	0	6	1.2	0	0	7.5	2.5	10	0	0	10	0	105.1	73.7	
13	2.4	0	11.5	10	5	1	0	2.5	6	16	0	3	0.5	0	6	1.2	5	0	7.5	2.5	10	0	0	10	0	100.1	68.2	
14	2.4	0	11.5	10	5	1	10	2.5	6	16	0	3	0.5	0	6	1.2	0	0	7.5	2.5	10	0	0	10	0	105.1	69.5	
15	2.4	0	11.5	10	5	1	0	2.5	6	16	0	3	0.5	0	6	1.2	0	0	7.5	2.5	10	0	50	10	0	145.1	93.1	
16	2.4	0	11.5	10	5	1	10	2.5	6	16	0	3	0.5	0	6	1.2	5	0	7.5	2.5	10	0	0	10	0	110.1	68.6	
17	2.4	0	11.5	10	5	1	0	2.5	6	16	0	3	0.5	0	6	1.2	0	0	7.5	2.5	10	0	0	10	0	95.1	57.5	
18	2.4	0	11.5	10	5	1	10	2.5	6	16	0	3	0.5	0	6	1.2	0	0	7.5	2.5	10	0	0	10	0	105.1	61.7	
19	2.4	0	11.5	10	5	1	0	2.5	6	16	0	3	0.5	0	6	1.2	0	0	7.5	2.5	10	0	0	10	0	95.1	54.2	
20	2.4	1.5	11.5	10	5	1	10	2.5	6	16	0	3	0.5	19	6	1.2	5	28	7.5	2.5	10	8	50	10	0	216.6	119.9	
																							TOTAL $			2696.2	2042.1	

NOTE: Most costs were as expected, except EPA oversight costs for FY '97-'98 were $40k instead of $20k, and for FY '98-'99 they are estimated at $30k instead of $20k.